

WHAT IS CLAIMED IS:

1. An optical head unit comprising:

- a first light source emitting a light with a first wavelength;
- a second light source emitting a light with a second wavelength;
- a third light source emitting a light with a third wavelength;
- a first objective lens irradiating said light emitted from said first light source onto an optical recording medium;
- a second objective lens irradiating said light emitted from said second light source or said light emitted from said third light source onto an optical recording medium; and
- a photodetector receiving a reflected light from said optical recording medium.

2. The optical head unit according to claim 1,

wherein said first wavelength is shorter than said second wavelength, and said second wavelength is shorter than said third wavelength.

3. The optical head unit according to claim 1,

wherein said first objective lens is designed to have a spherical aberration canceling a spherical aberration caused when said light with said first wavelength passes through said optical recording medium having a first thickness of protective layer, and

wherein said second objective lens is designed to have a spherical aberration canceling a spherical aberration caused when said light with said second wavelength passes through said optical recording medium having a second thickness of protective layer and to have a spherical

aberration canceling a spherical aberration caused when said light with said third wavelength passes through said optical recording medium having a third thickness of protective layer.

4. The optical head unit according to claim 3,

wherein said first thickness of the protective layer of said optical recording medium is smaller than said second thickness, and said second thickness is smaller than said third thickness.

5. The optical head unit according to claim 2,

wherein when said optical head unit is moved between an innermost circumference and an outermost circumference of said optical recording medium, a distance between a straight line including a track of a center of said first objective lens and a center of said optical recording medium is set to be shorter than a distance between a straight line including a track of a center of said second objective lens and said center of said optical recording medium.

6. The optical head unit according to claim 1,

wherein said photodetector includes a plurality of light reception parts.

7. The optical head unit according to claim 6,

wherein at least of said light reception parts is divided by a division line in parallel with a tangent direction of said optical recording medium.

8. The optical head unit according to claim 6,

wherein at least of said light reception parts is divided by a division line in parallel with

a radius direction of said optical recording medium.

9. The optical head unit according to claim 7,

wherein when an angle deviation amount between tracks in an innermost circumference and an outermost circumference of said optical recording medium and said division line in parallel with said tangent direction of said optical recording medium are θ_{\min} and θ_{\max} , respectively, said division line in parallel with said tangent direction of said optical recording medium is tilted by $(\theta_{\min} + \theta_{\max})/2$ with respect to a direction orthogonal to a track of said centers of said objective lenses.

10. The optical head unit according to claim 1, further comprising a diffraction optical device dividing at least one of said lights from said first light source, said second light source and said third light source into a zero order light, a + 1 order diffraction light and a - 1 order diffraction light.

11. The optical head unit according to claim 10,

wherein a grating pattern formed in said diffraction optical device is divided into a first area, a second area, a third area and a fourth area by a straight line in parallel with a radius direction of said optical recording medium and a straight line in parallel with a tangent direction thereof passing through an optical axis of its incident light, and wherein phases of said gratings of said first area and said fourth area and phases of said gratings of said second area and said third area are shifted from each other by $\pi/2$.

12. The optical head unit according to claim 1,

wherein said first wavelength is about 405nm, second wavelength is about 650nm, and said third wavelength is about 780nm.

13. An optical information writing/reading device comprising said optical head unit according to claim 1.

14. The optical information writing/reading device according to claim 13, further comprising:

a writing/reading circuit generating an input signal to at least one of said first light source, said second light source and said third light source and generating a read signal based on said reflected light from said optical recording medium;

a switching circuit switching transmission paths for supplying said input signal to said first light source, said second light source and said third light source; and

a control circuit controlling said switching circuit.

15. The optical information writing/reading device according to claim 14,

wherein said control circuit controls said switching circuit depending on a thickness of a protective layer of said optical recording medium.

16. The optical information writing/reading device according to claim 13, further comprising:

a first writing/reading circuit generating an input signal to said first light source and generating a read signal based on said reflected light from said optical recording medium;

a second writing/reading circuit generating an input signal to said second light source

and generating a read signal based on said reflected light from said optical recording medium;

a third writing/reading circuit generating an input signal to said third light source and generating a read signal based on said reflected light from said optical recording medium;

a switching circuit switching said first writing/reading circuit, said second writing/reading circuit, and said third writing/reading circuit; and

a control circuit controlling said switching circuit depending on a thickness of a protective layer of said optical recording medium.

17. An optical information writing/reading method comprising:

emitting a first wavelength of light;

emitting a second wavelength of light;

emitting a third wavelength of light;

irradiating at least one of said lights onto an optical recording medium based on a thickness of a protective layer of said optical recording medium; and

receiving a reflected light from said optical recording medium.

18. The optical information writing/reading method according to claim 17, further comprising:

generating an input signal to at least one of said lights; and

generating a read signal based on said reflected light from said optical recording medium.

19. The optical information writing/reading method according to claim 18, further comprising switching a path of said input signal and said read signal.

20. The optical information writing/reading method according to claim 19, further comprising controlling switching said path based on said thickness of said protective layer of said optical recording medium.

21. The optical information writing/reading method according to claim 17,

wherein said irradiating step includes irradiating said first wavelength of light when a protective layer of said optical recording medium has a first thickness, irradiating said second wavelength of light when a protective layer of said optical recording medium has a second thickness, and irradiating said third wavelength of light when a protective layer of said optical recording medium has a third thickness.